

REMARKS

Claims 1-18 are pending.

Claims 1, 7, and 18 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964).

Claim 2 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Lehureau (US 5,657,304).

Claims 3 and 5 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Sabsabi (US 6,008,897).

Claim 4 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Sabsabi (US 6,008,897).

Claims 6 and 15 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Magee et al (US 4,758,533).

Claim 8 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Ferguson (5,780,806).

Claim 9 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Andre (US 5,583,634).

Claim 10 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Svanberg (US 4,786,813).

Claim 11 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Lehureau (US 5,657,304).

Claim 12 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Sabsabi (US 6,008,897) and further in view of Sabsabi (US 5,781,289).

Claim 13 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) and Elings (US 4,407,964) in view of Sabsabi (US 6,008,897) and further in view of Sabsabi (US 6,008,897).

Claim 14 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Sabsabi (US 6,008,897) and further in view of Magee (US 4,758,533).

Claim 16 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Official Notice and further in view of Andre (US 5,583,634).

Claim 17 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US

4,407,964) and further in view of Andre (US 5,583,634) and further in view of Svanberg et al. (US 4,786,813).

Rejection under 35 USC §103(a) – claims 1, 7, and 18

Claims 1, 7, and 18 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964). This rejection is respectfully traversed.

Under MPEP §706.02(j), in order to establish a prima facie case of obviousness required for a §103 rejection, three basic criteria must be met: (1) there must be some suggestion or motivation either in the references or knowledge generally available to modify the reference or combine reference teachings (MPEP §2143.01), (2) a reasonable expectation of success (MPEP §2143.02), and (3) the prior art must teach or suggest all the claim limitations (MPEP §2143.03). See In re Royka, 490 F. 2d 981, 180 USPQ 580 (CCPA 1974).

Singh teaches an apparatus for conducting laser-induced breakdown spectroscopy where a laser beam focused on a sample creates atomic emissions that are analyzed. Col.6, lines 40-41. As pointed by the Office Action, Singh lacks a diaphragm, and a first optical means for projecting the image of the diaphragm to infinity. Furthermore, Singh teaches a fiber optic link (10) located on the behind lenses (9) and (8) on the side of the mirror (4) opposite to the lenses (5) and sample (6). “It is preferable for the emission spectrum to be transmitted via focusing lens (5), and separated from the laser light through the dichroic mirror (4), before being directed to the detector (11).” Col. 6, lines 42-47.

Contrary to the presently claimed invention, Singh proposes a device that does not make it possible to:

- obtain an optical emission spectrum on a continuous wavelength interval, because of the anti-reflective treatment of the dichroic mirror (transmission from 180nm to 510nm and from 550nm to 1000nm),
- install an object imaging device, because the spectrum analysis must take place in front of the analyzed object, which is the only location where a camera can be positioned (the spectrum analysis is carried out via fiber 14 in the present application),
- obtain a large numerical aperture, for a better control of the laser-matter interaction; Singh uses a lens (5) that induces aberrations as soon as a user attempts to reach a numerical aperture greater than 0.1.

Koester teaches a photo-coagulation apparatus concentrating a beam of light on a selected area of the fundus of a patient's eye. Col 7. Lines 54-56. The diaphragm in Koester is used as a mask for protecting the areas of the eye that must not be irradiated, by limiting the diameter of the beam. The diaphragm or screen 28 has an aperture of **adjustable** diameter. See col. 4, lines 13-18. Such device does not make it possible to keep a **constant** value for the resolution of the impact of the probe beam. In contrast, the presently claimed invention delimits the area of the interaction of the laser with the target with a diaphragm having an aperture of a **fixed** diameter.

Elings discloses fluoroimmunoassay involving sensing radiation for forward and back directions.

Applicant requests reconsideration of claims 1, 7, and 18 rejection for the following reasons:

(1) There is no justification in Singh, Koester, and Elings that suggests that the three references be combined in the manner proposed.

(2) Even if Singh, Koester, and Elings were to be combined in the manner proposed, the proposed combination would not suggest all of the claim limitations of claims 1, 7, and 18.

(1) There is no justification in Singh, Koester, and Elings that suggests that the three references be combined in the manner proposed.

Singh teaches an analytical method using laser-induced breakdown spectroscopy, whereas Koester relates to the photo-coagulation of the human eye, which is quite remote from an analytical method using laser-induced breakdown spectroscopy. Elings discloses immunoassay techniques, which is also quite remote from an analytical method using laser-induced breakdown spectroscopy.

A person skilled in the art of laser-induced breakdown spectroscopy and seeking to improve Singh's device would not consider the teachings of Koester or Elings because the latter relate to fields which are quite remote from Singh's field. Thus, Koester and Elings cannot be combined with Singh.

(2) Even if Singh, Koester, and Elings were to be combined in the manner proposed, the proposed combination would not suggest all of the claim limitations of claims 1, 7, and 18.

The combination of the teachings of Singh, Koester and Elings does not teach or suggest the limitations of claims 1, 7, and 18. Applicant respectfully disagrees with the Final Office action statement: "However, the combination as disclosed above inherently...dimension of the object" (see page 4, last line, to page 5, line 8). None of Singh, Koester and Elings discloses features of amended claim 1, namely:

"the second optical means receiving the image of said diaphragm projected to infinity by said first optical means and focusing it on said object to be analyzed..., wherein the image of said diaphragm focused on said object is equal to the required dimension on said object and the focal point of said laser beam, after crossing through said diaphragm and said first and second optical means, is outside the image plane of said diaphragm".

The hereinabove-mentioned cooperation of the diaphragm and the first and second optical means would not result from a combination of the three-cited documents. In particular, nothing suggests to place the telescope system 106 of Koester in such a way that the focusing lens 5 of Singh receives the image of diaphragm 28 of Koester, projected by the telescope system 106, and focuses this image on the carbon rod.

More important, in fact, diaphragm 28 and telescope system 106 of Koester are **not** used together. It is only explained that telescope system 106 can be used instead of diaphragm 28: see the word "alternatively" in Koester, column 4, line 18.

Besides another feature of amended claim 1 is disclosed by none of the three cited documents, namely the “means for displacing said object within a plane after each pulse of said laser source”. Contrary to what the Final Office Action indicates, this feature is not disclosed by Elings. The latter discloses an actuating arrangement 74 for shifting sample 62 (column 5, lines 13-15), but Elings does **not** suggest displacing sample 62 after each pulse of a laser source: perhaps there is question of an argon laser (column 5, line 5) but no pulsed laser source is mentioned so that it cannot be a question of displacing sample 62 after each pulse of a laser source.

Additional reasons can be given for the patentability of claim 18. The Final Office Action states that Koester teaches a diaphragm 28 usable for...delimiting the shape of the impact of the laser beam on an object to be analyzed (page 4, lines 12-14). However, Applicant respectfully disagrees: Koester's diaphragm 28 is interposed in the path of the light output of the laser means for determining the diameter of the cornea of the eye (see column 4, lines 11-18). In the presently claimed invention, light is focused on an object which would correspond to the retina of an eye, **not** the cornea which is the transparent anterior portion of the outer layer of the eye wall (see attached Appendix pages concerning the eye anatomy).

Thus, Applicant submits that claims 1, 7, and 18 recite novel subject matter which distinguishes over any possible combination of Singh, Koester, and Elings.

Rejection under 35 USC §103(a) – claim 2

Claim 2 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US

4,407,964) and further in view of Lehureau (US 5,657,304). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Rejection under 35 USC §103(a) – claims 3 and 5

Claims 3 and 5 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Sabsabi (US 6,008,897). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Rejection under 35 USC §103(a) – claim 4

Claim 4 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Sabsabi (US 6,008,897). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Rejection under 35 USC §103(a) – claims 6 and 15

Claims 6 and 15 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Magee et al (US 4,758,533). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Rejection under 35 USC §103(a) – claim 8

Claim 8 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Official Notice. This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Rejection under 35 USC §103(a) – claim 9

Claim 9 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Andre (US 5,583,634). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Rejection under 35 USC §103(a) – claim 10

Claim 10 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Svanberg (US 4,786,813). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Rejection under 35 USC §103(a) – claim 11

Claim 11 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Lehureau (US 5,657,304). This rejection is respectfully traversed.

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Rejection under 35 USC §103(a) – claim 12

Claim 12 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Sabsabi (US 6,008,897) and further in view of Sabsabi (US 5,781,289). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Rejection under 35 USC §103(a) – claim 13

Claim 13 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester and Elings and further in view of Sabsabi (US 6,008,897). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Rejection under 35 USC §103(a) – claim 14

Claim 14 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Sabsabi (US 6,008,897) and further in view of Magee (US 4,758,533). This rejection is respectfully traversed.

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Rejection under 35 USC §103(a) – claim 16

Claim 16 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Official Notice and further in view of Andre (US 5,583,634). This rejection is respectfully traversed.

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Rejection under 35 USC §103(a) – claim 17

Claim 17 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Singh (US 5,781,289) in view of Koester et al. (US 5,026,159) and Elings (US 4,407,964) and further in view of Andre (US 5,583,634) and further in view of Svanberg et al. (US 4,786,813). This rejection is respectfully traversed.

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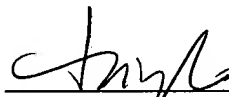
Conclusion

For all of the above reasons, applicants submit that the amended claims are now in proper form, and that the amended claims all define patentable subject matter over the prior art. Therefore, Applicants submit that this application is now in condition for allowance.

Request for allowance

It is believed that this Amendment places the above-identified patent application into condition for allowance. Early favorable consideration of this Amendment is earnestly solicited: If, in the opinion of the Examiner, an interview would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at the number indicated below.

Respectfully submitted,
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Dated: December 11, 2003

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Attachments: Appendix



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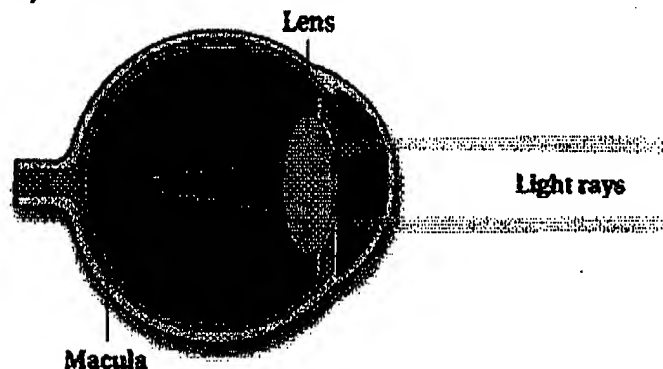
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The Eye



How We See

What we know as light is actually a tiny portion of a vast spectrum of electromagnetic waves. Objects either give off or reflect light. We perceive an object when its light waves enter the eye and an image of the object is focused on the retina.



The lens and the cornea comprise the optical system and are similar in function to the lens of a camera. Both play a role in bending and focusing light rays. In the eye, the image is focused on the retina, which is the thin layer of light-sensitive tissue lining the back of the eye. In a camera, the image is captured on film, which is also a photosensitive surface. The retina, however, is much more elaborate since a great deal of complex information-processing takes place here. It is considered the first of a series of steps in the pathway to vision. To begin with, the receptors in the retina, called rods and cones, absorb light, which in turn leads to their activation. These receptor cells are connected to other cells that aid in the transport of the information. The output from the retina is via special cells whose ends form the optic nerve. This helps the optical message travel to the thalamus, where it is then passed along to the part of the brain responsible for vision, thus enabling us to see.



Did you know that?

When we look at an object that has more than one dimension, the image formed on the retina is upside down and also reversed right to left relative to the original object.

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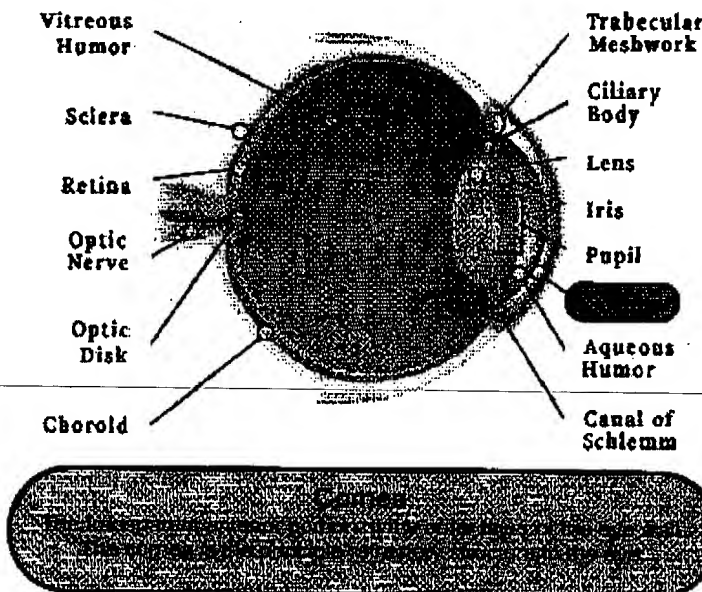
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Basic Anatomy

There are a number of important structures that play a part in how we see. Simply put, objects transmit light to the retina, which is the light-sensitive part of the eye, and then, this information is translated by the part of the brain responsible for vision.

To obtain a better understanding of the various parts of the eye and their respective roles, click on the structure of interest.

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